

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

Project 2694-2

Report One

A Progress Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

February 1, 1967

CODE LETTERS FOR PROJECT 2694-2

Company-Mill-Machine	Code Letter
The Chesapeake Corporation - West Point No. 1	--
Container Corp. of America - Circleville No. 5	--
Continental Can Company - Hopewell No. 1	M
- Hodge No. 1	Z
Crown Zellerbach Corp. - Baltimore No. 1	O
- Baltimore No. 2	U
- Bogalusa No. 4	R
- Lebanon No. 2	--
Hoerner Waldorf Corp. - Ontonagon No. 1	I
- St. Paul No. 4	T
- St. Paul No. 5	AA
International Paper Co. - Bastrop No. 1	X
- Bastrop No. 2	K
- Georgetown No. 1	C
The Mead Corporation - Harriman No. 1	J
- Knoxville No. 1	Q
- Lynchburg No. 2	A
- Sylva No. 1	CC
- Sylva No. 2	E
Olinkraft, Inc. - West Monroe No. 1	--
- West Monroe No. 2	FF
- West Monroe No. 3	F
Owens-Illinois, Inc. - Big Island No. 1	Y
- Big Island No. 3	EE
- Tomahawk No. 1	H
- Tomahawk No. 2	W
- Tomahawk No. 3	L
Packaging Corp. of America - Filer City No. 1	G
- Filer City No. 2	N
St. Joe Paper Company - Port St. Joe No. 1	DD
St. Regis Paper Company - Coshocton No. 1	--
Union Camp Corporation - Savannah No. 2	V
- Monroe No. 2	B
West Va. Pulp & Paper Co. - Covington No. 6	S
- Covington No. 7	BB
- Williamsburg No. 1	D
- Williamsburg No. 2	--
Weyerhaeuser Company - Plymouth No. 3	P

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

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PREFACE

Please note that Project 1108-17 formerly used to identify the base-line study on corrugating medium has been discontinued and that Project 2694-2 is now being used. The current report is the first to be issued under the new project number.

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CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

INTRODUCTION

As requested by the Technical Division of the Fourdrinier Kraft Board Institute, Inc., the reports pertinent to the continuous evaluation of corrugating medium have been prepared by The Institute of Paper Chemistry on a bimonthly instead of monthly basis since August 1, 1961. The current report presents results obtained during the months of December, 1966 and January, 1967, on 212 rolls of corrugating medium representing the production of thirty-two machines. Each of these 212 rolls of corrugating medium was evaluated for basis weight, caliper, Concora flat crush (conditioned after fluting), H. and D. flat crush on single-faced board, and runnability. The evaluation of runnability was initiated by corrugating each roll under standardized conditions on the Institute's corrugator into A-flute board at 600 feet per minute with minimum tension and recording the draw factor at this condition if the roll ran satisfactorily. If unsatisfactory runnability occurred at this speed, however, the corrugator was slowed down in increments of 25 f.p.m. until satisfactory runnability was obtained, i.e., no fractured flutes. In this latter case the draw factor was recorded for the highest speed below 600 f.p.m. at which the roll ran satisfactorily. On the other hand, if the medium fabricated satisfactorily at 600 f.p.m. with minimum tension, further runs were made at higher tensions to determine when fracturing occurred. The higher tensions used were 0.5, 1.0, and 1.5 lb. per inch. Flat crush was determined on the single-faced board obtained at a speed of 600 f.p.m. with minimum tension, or if the medium could not be corrugated satisfactorily at 600 f.p.m. with minimum tension, at the highest speed the medium could be corrugated with minimum tension. The flat crush results, in addition to supplying information about

quality, provide data which may be used by each participant to evaluate the nature of the quantitative relationship between Concora flat crush and combined board flat crush for his medium.

For each participating machine, test data for the current period are shown in Table I and presented graphically in Fig. 1 to 4. A tabulation of the number of rolls and type of medium evaluated is also given in Table I for each machine. The current machine test averages given in Table I are the means for each test property of the averages obtained on all rolls of corrugating medium evaluated from a given machine during the current period. In addition to the current machine test averages, Table I also presents the current F.K.I. averages, cumulative F.K.I. averages, and the F.K.I. indexes. The current F.K.I. average for each test property is the mean of the current machine averages for the same property for all machines participating in the study during a given period (excluding the current machine averages based on the evaluation of fewer than three rolls of corrugating medium as requested by the Technical Division). The cumulative F.K.I. average for each test property is the mean of the current F.K.I. averages for the same property for the previous twelve-month period excluding the average for the current period. The F.K.I. index for each test property is obtained as follows:

$$\frac{\text{current F.K.I. average}}{\text{cumulative F.K.I. average}} \times 100 = \text{F.K.I. index (\%)}$$

The F.K.I. index for each test property provides a ready means of comparing current average quality with that for the previous twelve months. An index greater than 100% indicates, of course, that current average quality is higher than the average result for the previous twelve months; similarly, an index below 100% indicates that current average quality is lower than that for the previous twelve months.

TABLE I
SUMMARY OF CURRENT MACHINE AVERAGES
December, 1966 and January, 1967

Mill Code	No. of Rolls	Type of Medium	Basis Weight, lb.	Caliper, points	Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.
A	10	Semichemical	26.6	11.2	36.6	31.8
B	4	Bogus	26.8	11.8	28.9	27.0
C	6	Semichemical	28.1	9.7	40.6	36.8
D	8	Semichemical	27.6	10.7	32.5	30.0
E	9	Semichemical	26.1	10.0	32.0	28.6
F	2	Semichemical	Note ^a			
G	8	Semichemical	26.6	9.7	33.5	30.2
H	8	Semichemical	27.0	10.1	38.3	33.4
I	9	Semichemical	27.6	10.4	36.7	31.7
J	6	Semichemical	26.6	10.5	31.6	29.9
K	12	Semichemical	26.7	10.5	37.9	35.2
L	5	Semichemical	27.0	11.0	35.4	30.9
M	9	Semichemical	27.5	10.7	38.3	34.7
N	8	Semichemical	26.6	10.3	32.2	28.9
O	8	Bogus	28.1	10.1	35.7	30.9
P	10	Semichemical	26.7	10.6	36.0	32.6
Q	6	Semichemical	26.4	12.1	32.4	29.8
R	6	Semichemical	27.6	10.5	33.5	31.3
S	8	Semichemical	27.1	10.9	35.0	30.6
T	4	Semichemical	27.3	10.7	32.5	28.9
U	8	Bogus	27.5	10.5	32.7	29.7
V	8	Semichemical	26.9	9.9	35.5	30.6
W	7	Semichemical	26.6	10.5	35.3	32.1
X	4	Semichemical	27.4	10.5	39.7	36.4
Y	14	Semichemical	26.5	10.1	33.4	31.1
Z	4	Semichemical	27.2	10.2	35.4	32.7
AA	2	Semichemical	Note ^a			
BB	1	Semichemical	Note ^a			
CC	9	Semichemical	26.7	10.1	32.8	30.0
DD	2	Kraft	Note ^a			
EE	6	Semichemical	26.9	11.1	32.8	27.8
FF	1	Semichemical	Note ^a			
Total	212					
Current F.K.I. Average			27.0	10.5	34.7	31.3
Cumulative F.K.I. Average			27.0	10.4	35.2	32.2
F.K.I. Index, %			100.0	101.6	98.7	97.2

^aCurrent machine average has been omitted in compliance with the Technical Division's request that current machine averages based on evaluations of fewer than three rolls of medium should be excluded from the summary table and from the calculation of the current F.K.I. averages.

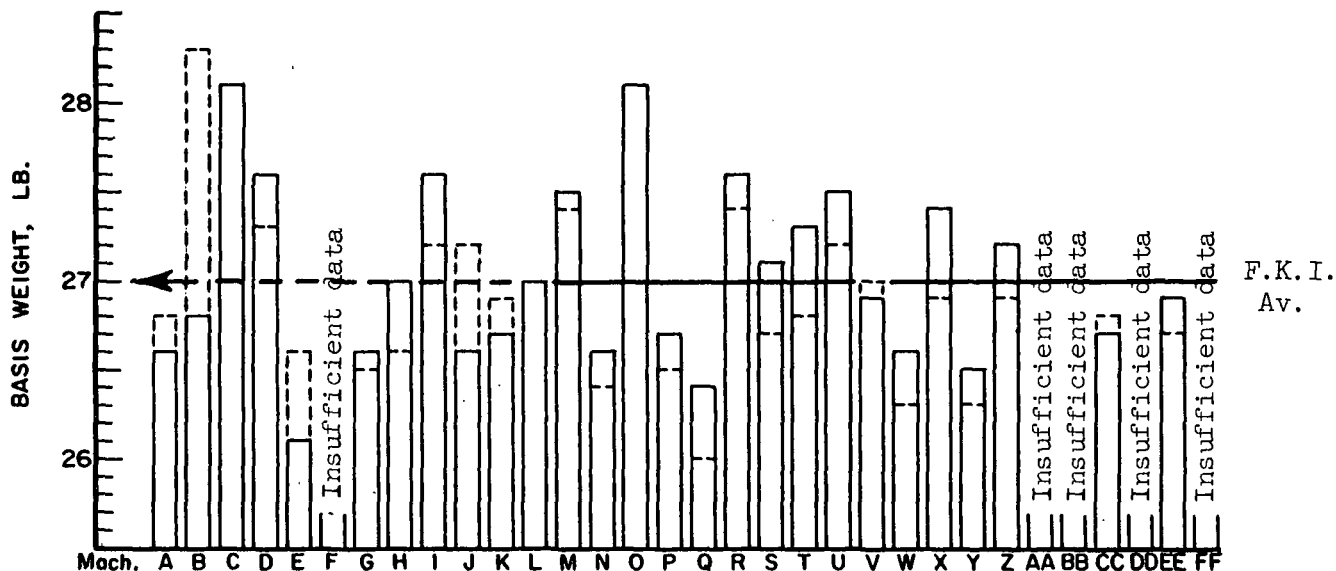


Figure 1. Comparison of Basis Weight Results

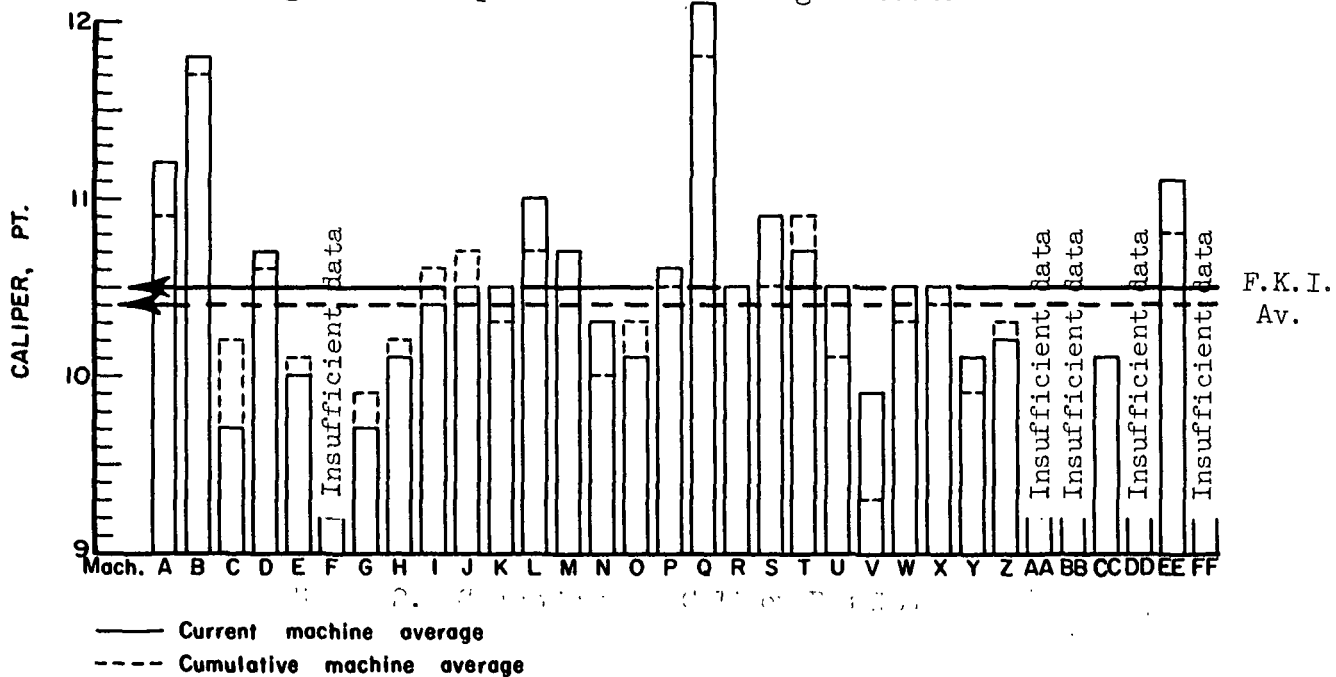


Figure 2. Comparison of Caliper Results

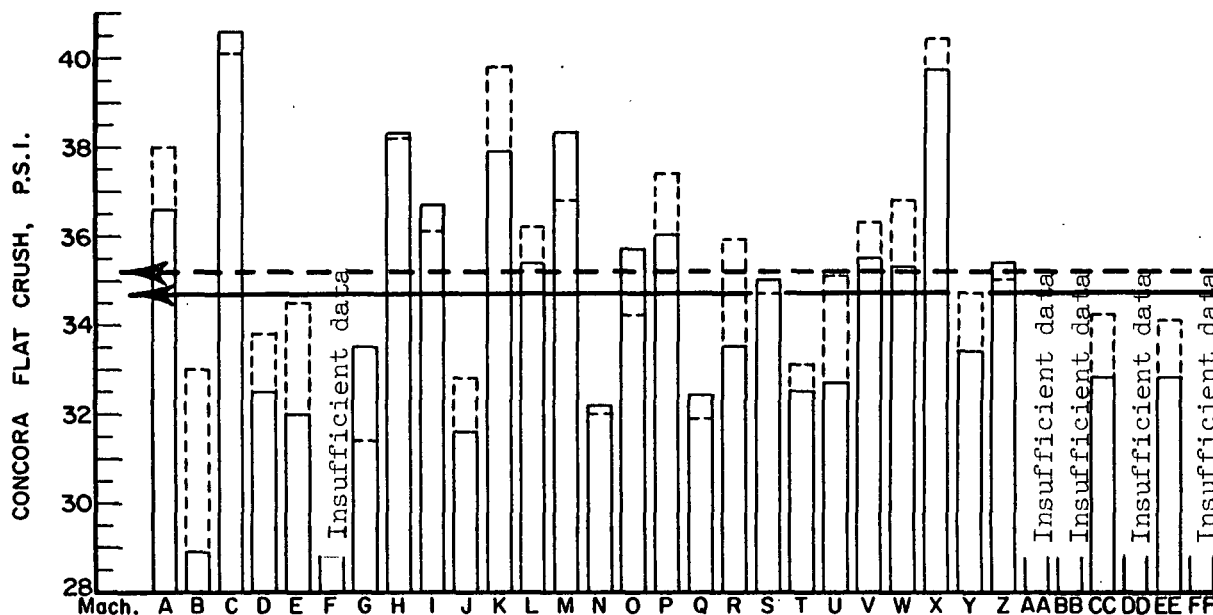
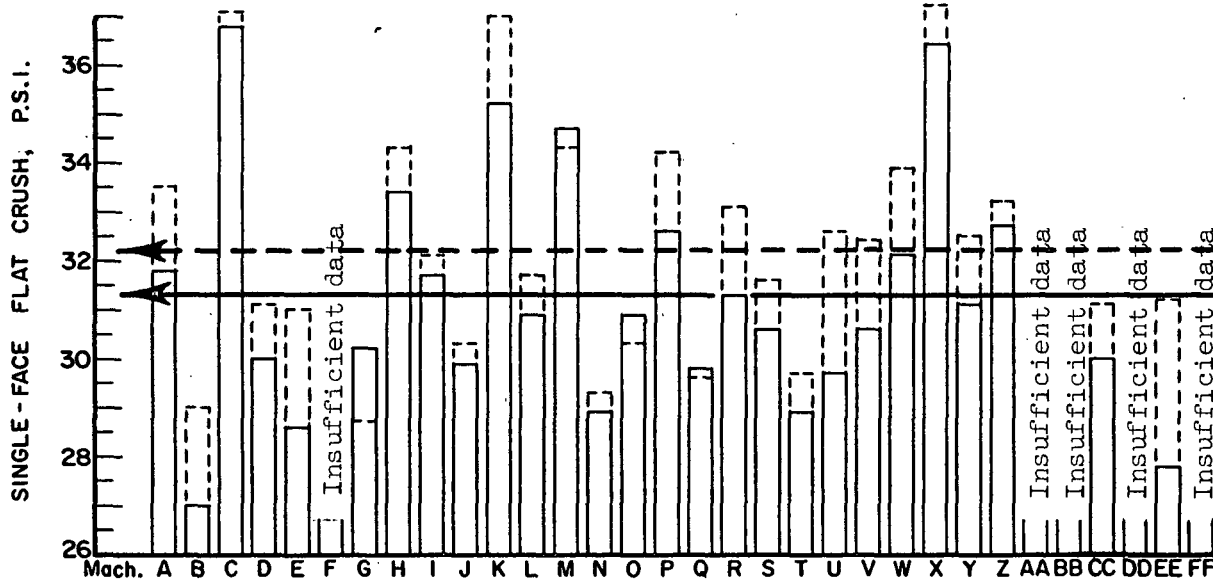


Figure 3. Comparison of Concora Flat Crush Results



— Current machine average
- - - Cumulative machine average

Figure 4. Comparison of Single-Face Flat Crush Results

The test results obtained on the rolls submitted from the production of individual machines during the current period are shown in Tables II through XXXIII for Machines A through Z and Machines AA, BB, CC, DD, EE, and FF, respectively. The maximum, minimum, and average results obtained on each roll are shown for all test properties except basis weight for which only the average is shown; in addition, the overall average result for all rolls submitted from a given machine is shown for each test property. The latter overall averages are reported as "current machine averages." A cumulative machine average for each test property is also shown and represents the mean of the current machine averages for the same property for the previous twelve periods (excluding the current period). Also shown for each machine and for each test property in Tables II to XXXIII are a machine factor and machine index which are defined as follows:

$$\frac{\text{current machine average}}{\text{cumulative machine average}} \times 100 = \text{machine factor (\%)}$$

$$\frac{\text{current machine average}}{\text{cumulative F.K.I. average}} \times 100 = \text{machine index (\%)}$$

The machine factor and machine index provide a means for comparing the current machine average for each test property with either the previous results for the particular machine or with the cumulative results for all machines, i.e., the cumulative F.K.I. average.

TABLE II
SUMMARY OF TEST RESULTS FOR MACHINE A
December, 1966 and January, 1967
(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ²	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability,	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	lb./in. ^a	draw factor ^b
A-1	11-22-66	12- 5-66	433	27.5	12.0	10.4	11.3	40.8	39.0	39.5	34.8	33.8	34.5	1	1.566
A-2	11-22-66	12- 5-66	434	26.7	11.7	10.6	11.0	41.4	34.8	38.0	33.0	31.6	32.4	1-1/2	1.569
A-3	12- 5-66	12-14-66	441	26.7	11.5	10.7	11.0	39.6	36.0	38.2	32.8	31.0	32.0	1-1/2	1.568
A-4	12- 5-66	12-14-66	442	26.4	11.3	10.3	10.9	39.0	31.2	35.5	31.4	28.4	29.7	1-1/2	1.566
A-5	12-11-66	12-23-66	449	26.5	11.5	11.0	11.3	40.8	34.2	36.8	34.8	30.6	32.8	1-1/2	1.568
A-6	12-11-66	12-23-66	450	26.6	11.4	10.7	11.1	37.8	33.0	35.6	34.0	32.6	33.1	1-1/2	1.567
A-7	12-29-66	1- 6-67	457	26.6	11.4	11.0	11.2	35.4	30.6	33.6	30.6	28.0	29.3	1-1/2	1.570
A-8	12-29-66	1- 6-67	458	26.6	12.0	11.3	11.8	34.8	33.0	34.2	30.2	28.6	29.2	1-1/2	1.570
A-9	1- 3-67	1-11-67	465	26.2	11.7	10.7	11.0	38.4	34.8	36.5	33.0	30.2	31.7	1-1/2	1.568
A-10	1- 3-67	1-11-67	466	26.4	11.6	10.3	11.0	40.2	34.8	37.6	35.0	31.8	33.4	1-1/2	1.567
Current machine average				26.6			11.2			36.6			31.8		1.568
Cumulative machine average				26.8			10.9			38.0			33.5		
Machine factor, %				99.3			102.5			96.1			94.9		
Machine index, %				98.5			107.6			103.9			98.9		

TABLE III
SUMMARY OF TEST RESULTS FOR MACHINE B
December, 1966 and January, 1967
(Type of medium: bogus)

B-1	12- 5-66	1- 3-67	100	26.8	12.8	11.0	11.9	27.6	24.6	26.3	27.0	23.8	25.4	1-1/2	1.561
B-2	12- 7-66	1- 3-67	101	26.8	12.2	11.0	11.8	28.8	25.8	27.5	26.8	24.8	25.4	1-1/2	1.564
B-3	12- 9-66	1- 3-67	102	28.0	13.8	11.9	13.0	33.0	27.6	31.1	28.8	24.6	27.3	1/2	1.560
B-4	12-13-66	1- 3-67	103	25.5	11.2	9.9	10.6	34.8	28.8	30.6	30.8	28.2	30.0	1-1/2	1.557
Current machine average				26.8			11.8			28.9			27.0		1.560
Cumulative machine average				28.3			11.7			33.0			29.0		
Machine factor, %				94.6			101.5			87.4			93.1		
Machine index, %				99.0			114.2			82.1			84.0		

^aMaximum tension at 600 f.p.m.

^b600 f.p.m., minimum tension.

TABLE IV
SUMMARY OF TEST RESULTS FOR MACHINE C
December, 1966 and January, 1967

(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M.ft. ²	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, lb./in. ^a	draw factor ^b
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
C-1	10-30-66	12- 6-66	639	27.7	9.9	9.1	9.6	43.2	38.4	41.4	39.2	36.0	37.7	Note ^c	1.540
C-2	11-11-66	12- 6-66	640	27.5	10.0	9.3	9.8	40.2	34.2	38.9	38.0	35.6	37.0	Note ^d	1.542
C-3	11-28-66	1-16-67	641	28.0	10.0	9.4	9.8	45.0	40.2	41.9	37.2	35.2	36.4	Min.	1.543
C-4	12- 6-66	1-16-67	642	29.1	10.2	9.5	9.9	43.8	37.8	41.4	37.6	34.8	36.2	Min.	1.555
C-5	12-19-66	1-16-67	643	28.2	10.1	9.5	9.8	42.6	39.0	40.3	37.8	36.0	37.0	Min.	1.551
C-6	12-29-66	1-16-67	644	28.3	10.2	9.3	9.7	41.4	38.4	39.8	38.4	34.6	36.5	Min.	1.553
Current machine average				28.1			9.7			40.6			36.8		1.547
Cumulative machine average				28.1			10.2			40.1			37.1		
Machine factor, %				100.0			95.1			101.3			99.3		
Machine index, %				104.1			94.0			115.5			114.4		

TABLE V
SUMMARY OF TEST RESULTS FOR MACHINE D
December, 1966 and January, 1967

(Type of medium: semichemical)

D-1	11- 3-66	12- 5-66	129	27.3	10.7	10.1	10.4	34.8	28.2	31.4	30.6	27.6	28.7	Min.	1.559
D-2	11- 7-66	12- 5-66	130	27.3	11.0	10.4	10.8	34.2	31.2	32.5	31.2	29.2	29.9	Min.	1.552
D-3	11-15-66	12- 5-66	131	28.0	10.9	10.4	10.7	34.8	31.8	33.5	31.4	30.4	30.6	Min.	1.550
D-4	11-23-66	12- 5-66	132	28.7	11.3	11.0	11.1	34.8	32.4	34.0	32.4	30.8	31.6	Note ^e	1.544
D-5	12- 2-66	1-10-67	133	27.3	10.9	10.4	10.8	34.2	31.2	32.6	30.6	29.2	29.9	Min.	1.547
D-6	12- 9-66	1-10-67	134	27.3	11.0	10.7	10.9	33.0	29.4	31.6	29.2	28.0	28.7	Note ^e	1.551
D-7	12-15-66	1-10-67	135	27.6	10.8	10.1	10.3	33.6	31.2	32.3	32.4	27.8	30.8	Note ^f	1.547
D-8	12-29-66	1-10-67	136	27.4	10.9	10.0	10.4	33.6	31.2	32.2	31.4	28.6	29.8	Min.	1.556
Current machine average				27.6			10.7			32.5			30.0		1.551
Cumulative machine average				27.3			10.6			33.8			31.1		
Machine factor, %				101.2			100.4			96.1			96.4		
Machine index, %				102.2			103.0			92.4			93.3		

^aMaximum tension at 600 f.p.m.

^b600 f.p.m., minimum tension.

^cMaximum speed at which this roll could be corrugated with minimum tension was 350 f.p.m.

^dMaximum speed at which this roll could be corrugated with minimum tension was 425 f.p.m.

^eMaximum speed at which this roll could be corrugated with minimum tension was 400 f.p.m.

^fMaximum speed at which this roll could be corrugated with minimum tension was 500 f.p.m.

TABLE VI
SUMMARY OF TEST RESULTS FOR MACHINE E
December, 1966 and January, 1967
(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ^a	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, draw ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	lb./in. ^a	factor ^b
E-1	11-12-66	11-29-66	76	26.4	10.9	10.0	10.4	34.8	29.4	32.8	31.6	28.2	30.0	Min.	1.561
E-2	11-18-66	11-30-66	77	25.1	9.8	9.3	9.6	36.0	31.8	33.0	29.4	26.6	28.1	1-1/2	1.570
E-3	11-30-66	12- 9-66	78	26.0	10.9	9.9	10.4	31.8	28.2	29.9	27.2	24.6	26.4	1/2	1.567
E-4	12- 7-66	12-23-66	79	27.1	10.4	9.7	10.0	36.6	31.2	33.6	31.4	30.6	31.0	Min.	1.562
E-5	12-15-66	12-28-66	80	26.5	10.6	9.9	10.2	34.8	30.6	32.8	32.2	30.2	31.3	Min.	1.563
E-6	12-20-66	1- 5-67	81	25.9	9.3	8.7	9.1	34.2	30.6	32.6	28.6	27.8	28.3	Min.	1.563
E-7	12-29-66	1-11-67	82	25.4	10.9	9.8	10.3	31.8	28.2	30.1	30.6	27.4	28.6	Min.	1.556
E-8	1- 5-67	1-16-67	83	26.4	10.6	10.1	10.3	33.6	29.4	31.4	28.2	27.8	28.0	Min.	1.564
E-9	1-11-67	1-19-67	84	25.7	10.2	9.7	9.9	34.8	28.2	31.8	27.0	23.6	26.0	1/2	1.567
Current machine average				26.1	10.0			32.0			28.6			1.564	
Cumulative machine average				26.6	10.1			34.5			31.0				
Machine factor, %				97.9	99.7			92.8			92.2				
Machine index, %				96.4	96.7			91.0			89.0				

TABLE VII
SUMMARY OF TEST RESULTS FOR MACHINE F
December, 1966 and January, 1967
(Type of medium: semichemical)

F-1	11-13-66	12-15-66	22	28.2	9.6	9.2	9.4	46.8	40.8	43.4	40.6	37.0	38.5	1/2	1.567
F-2	11-28-66	12-23-66	23	30.9	10.8	10.0	10.5	42.6	37.2	40.9	39.4	36.8	37.8	Note ^c	1.557
Current machine average				29.5	9.9			42.2			38.2			1.562	
Cumulative machine average				27.6	10.2			29.6			27.6				
Machine factor, %				107.1	97.3			142.4			138.4				
Machine index, %				109.2	95.9			119.9			118.6				

^aMaximum tension at 600 f.p.m.

^b600 f.p.m. minimum tension.

^cMaximum speed at which this roll could be corrugated with minimum tension was 375 f.p.m.

TABLE VIII

SUMMARY OF TEST RESULTS FOR MACHINE G
December, 1966 and January, 1967

(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ^a	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, lb./in. ^a draw factor ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
G-1	11-28-66	12- 6-66	244	27.1	10.0	9.5	9.9	33.0	28.8	31.1	30.6	29.2	30.0	1-1/2	1.574
G-2	12- 4-66	12- 8-66	245	26.9	9.8	9.2	9.5	37.2	32.4	35.3	31.8	30.0	31.0	1-1/2	1.575
G-3	12-11-66	12-16-66	246	26.3	9.9	9.3	9.6	35.4	28.8	32.9	30.6	29.0	30.0	1-1/2	1.575
G-4	12-17-66	12-22-66	247	26.4	9.5	9.0	9.3	37.2	30.6	35.3	32.8	30.6	31.0	1-1/2	1.575
G-5	12-24-66	1- 3-67	248	26.3	9.9	9.3	9.6	34.2	27.6	32.0	31.8	28.4	29.7	1-1/2	1.575
G-6	1- 1-67	1- 6-67	249	26.1	9.7	9.0	9.4	37.2	30.0	33.2	32.0	30.0	30.7	1-1/2	1.573
G-7	1- 8-67	1-13-67	250	27.0	10.7	10.3	10.4	36.6	35.4	35.8	32.0	29.6	30.8	1-1/2	1.574
G-8	1-19-67	1-25-67	251	26.6	9.9	9.4	9.7	34.8	28.8	32.4	29.2	26.0	28.2	1-1/2	1.574
Current machine average				26.6			9.7			33.5			30.2		1.574
Cumulative machine average				26.5			9.9			31.4			28.7		
Machine factor, %				100.4			97.4			106.7			105.3		
Machine index, %				98.4			93.2			95.2			93.8		

TABLE IX

SUMMARY OF TEST RESULTS FOR MACHINE H
December, 1966 and January, 1967

(Type of medium: semichemical)

H-1	12-28-66	1- 6-67	---	27.4	10.5	10.0	10.1	42.0	39.0	39.8	35.2	33.6	34.4	1-1/2	1.565
H-2	12-28-66	1- 6-67	---	27.8	10.7	10.0	10.2	42.0	38.4	40.4	35.6	34.6	35.0	1-1/2	1.566
H-3	1-12-67	1-23-67	A	26.2	10.2	9.9	10.0	37.8	34.2	36.1	32.4	30.2	31.4	1-1/2	1.570
H-4	1-12-67	1-23-67	B	26.4	10.3	9.9	10.0	40.2	34.8	37.1	33.6	31.4	32.4	1-1/2	1.570
H-5	1-13-67	1-23-67	---	27.0	10.3	9.9	10.1	41.4	37.8	39.1	34.8	32.4	33.2	1-1/2	1.570
H-6	1-14-67	1-23-67	---	26.7	10.2	9.8	10.0	37.8	35.4	36.7	34.4	32.6	33.3	1-1/2	1.571
H-7	1-15-67	1-23-67	---	27.7	10.7	10.0	10.3	42.0	36.0	38.4	35.6	33.4	34.6	1-1/2	1.571
H-8	1-16-67	1-23-66	---	27.2	10.6	9.9	10.2	40.8	36.0	38.6	33.6	31.2	32.7	1-1/2	1.572
Current machine average				27.0			10.1			38.3			33.4		1.569
Cumulative machine average				26.6			10.2			38.2			34.3		
Machine factor, %				101.5			99.7			100.3			97.4		
Machine index, %				100.0			97.6			108.9			103.8		

^aMaximum tension at 600 f.p.m.^b600 f.p.m., minimum tension.

TABLE X
SUMMARY OF TEST RESULTS FOR MACHINE I
December, 1966 and January, 1967

(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ²	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, lb./in. ^a draw ^b factor ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
I-1	11-23-66	12- 1-66	99	26.5	10.0	9.3	9.7	40.2	31.8	36.1	35.6	33.4	34.2	Min. ^c	1.564
I-2	11-29-66	12- 6-66	100	29.3	11.3	10.8	11.0	41.4	35.4	38.9	35.8	33.2	34.2	Note ^d	1.559
I-3	12- 5-66	12- 8-66	101	27.5	11.9	10.5	11.3	36.6	33.0	35.4	32.6	30.2	31.0	Note ^d	1.567
I-4	12-18-66	12-28-66	102	26.9	9.8	8.9	9.4	37.2	33.6	34.9	33.6	30.2	31.9	Min.	1.563
I-5	12-19-66	12-28-66	103	26.8	10.6	9.8	10.2	39.6	33.6	37.6	33.4	31.8	32.7	Min.	1.566
I-6	12-30-66	1- 9-67	104	27.5	11.2	10.0	10.5	34.8	32.4	33.5	29.8	27.4	28.6	1/2	1.568
I-7	1- 3-67	1- 9-67	105	27.9	11.0	10.0	10.4	42.0	39.0	40.6	34.4	32.8	33.3	Min.	1.565
I-8	1-10-67	1-16-67	106	37.9	10.9	10.4	10.7	41.4	38.4	39.8	33.0	30.8	32.3	Min.	1.567
I-9	1-17-67	1-23-67	107	27.8	11.3	10.2	10.8	36.0	30.6	33.5	28.8	26.8	27.3	1	1.574
Current machine average				27.6			10.4			36.7			31.7		1.566
Cumulative machine average				27.2			10.6			36.1			32.1		
Machine factor, %				101.2			98.2			101.5			98.7		
Machine index, %				102.1			100.0			104.3			98.7		

TABLE XI
SUMMARY OF TEST RESULTS FOR MACHINE J
December, 1966 and January, 1967

(Type of medium: semichemical)

J-1	11-16-66	11-28-66	1659	27.1	11.5	10.7	11.0	34.2	28.8	32.4	33.6	30.2	32.0	1/2	1.558
J-2	11-16-66	11-28-66	1660	26.8	10.9	10.4	10.8	33.6	30.6	32.0	32.2	31.0	31.6	1	1.561
J-3	11-29-66	12-14-66	1667	26.5	10.9	10.1	10.5	34.8	29.4	32.0	32.8	26.4	29.3	1-1/2	1.567
J-4	11-29-66	12-14-66	1668	26.3	10.8	10.2	10.4	33.6	29.4	30.7	30.0	27.0	28.4	1-1/2	1.566
J-5	11-29-66	12-14-66	1675	26.3	10.7	9.9	10.4	34.2	28.8	31.3	30.0	28.4	29.4	1-1/2	1.566
J-6	11-29-66	12-14-66	1676	26.5	10.5	9.8	10.1	33.0	28.8	31.2	30.2	27.2	28.9	1-1/2	1.565
Current machine average				26.6			10.5			31.6			29.9		1.564
Cumulative machine average				27.2			10.7			32.8			30.3		
Machine factor, %				97.8			98.8			96.4			98.7		
Machine index, %				98.4			101.5			89.9			93.1		

^aMaximum tension at 600 f.p.m.

^b600 f.p.m., minimum tension.

^cMaximum speed at which this roll could be corrugated with minimum tension was 200 f.p.m.

^dMaximum speed at which this roll could be corrugated with minimum tension was 475 f.p.m.

TABLE XII

SUMMARY OF TEST RESULTS FOR MACHINE K
December, 1966 and January, 1967

(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ²	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Fact Flat Crush, p.s.i.			Runnability, lb./in. ^a draw factor ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
K-1	11-17-66	12-1-66	480	25.7	10.3	9.2	10.0	39.0	36.0	37.8	36.4	34.6	35.2	1	1.557
K-2	11-17-66	12-1-66	481	26.4	10.2	9.8	10.1	41.4	37.2	39.2	35.6	33.8	34.6	1	1.556 —
K-3	11-22-66	12-5-66	482	28.3	11.4	10.0	11.0	42.0	39.6	41.2	37.6	35.0	36.2	1/2	1.555
K-4	11-24-66	12-5-66	483	27.5	11.3	10.4	10.9	40.8	34.8	37.7	36.0	33.2	34.6	1	1.556
K-5	11-28-66	12-9-66	484	26.7	10.7	9.9	10.4	37.2	34.8	36.5	36.2	32.6	34.8	1/2	1.563
K-6	12-6-66	12-19-66	485	26.9	11.0	10.0	10.4	42.0	35.4	39.2	37.2	35.8	36.3	1-1/2	1.566 —
K-7	12-14-66	1-3-67	486	26.6	10.9	10.2	10.5	41.4	36.0	37.6	36.8	33.2	35.5	1/2	1.560
K-8	12-20-66	1-3-67	487	26.9	11.3	10.3	10.7	40.2	38.4	39.5	39.0	36.4	37.4	1/2	1.550
K-9	12-21-66	1-3-67	488	26.4	11.0	10.0	10.4	38.4	36.6	37.3	38.2	36.0	37.1	1	1.560
K-10	12-28-66	1-9-67	489	26.3	11.2	10.3	10.7	39.6	36.0	38.0	37.2	34.0	35.4	1/2	1.558
K-11	1-2-67	1-9-67	490	26.7	10.8	10.0	10.5	38.4	34.2	36.8	34.0	31.6	32.7	1/2	1.561
K-12	1-9-67	1-17-67	491	26.5	10.4	10.0	10.2	37.8	31.2	34.1	33.6	30.4	32.5	1/2	1.559
Current machine average				26.7			10.5			37.9			35.2		1.558 —
Cumulative machine average				26.9			10.3			39.8			37.0		
Machine factor, %				99.5			101.5			95.2			95.1		
Machine index, %				99.0			101.1			107.8			109.4		

TABLE XIII

SUMMARY OF TEST RESULTS FOR MACHINE L
December, 1966 and January, 1967

(Type of medium: semichemical)

L-1	11-21-66	12-27-66	---	27.0	11.8	10.9	11.2	39.0	34.8	36.8	32.8	30.6	31.9	1/2	1.565
L-2	11-22-66	12-27-66	---	27.1	11.7	11.0	11.3	41.4	34.8	37.8	34.6	30.4	32.3	Min.	1.564
L-3	1-14-67	1-23-67	---	27.1	11.0	10.3	10.7	35.4	29.4	34.0	32.2	28.6	30.2	1-1/2	1.570
L-4	1-15-67	1-23-67	---	27.0	11.0	10.3	10.7	37.2	31.8	34.4	32.0	30.0	30.8	1-1/2	1.573
L-5	1-17-67	1-23-67	---	27.0	11.0	10.4	10.8	35.4	31.8	34.1	31.4	27.6	29.4	1-1/2	1.573
Current machine average				27.0			11.0			35.4			30.9		1.569
Cumulative machine average				27.0			10.7			36.2			31.7		
Machine factor, %				100.0			102.7			97.8			97.4		
Machine index, %				100.0			105.7			100.7			96.1		

^aMaximum tension at 600 f.p.m.

^b600 f.p.m., minimum tension.

TABLE XIV

SUMMARY OF TEST RESULTS FOR MACHINE M
December, 1966 and January, 1967

(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./Mft. ^a	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, lb./in. ^a draw ^b factor ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
M-1	10-29-66	11-29-66	578	28.2	11.6	11.0	11.4	40.8	34.8	38.3	36.8	34.6	35.8	1-1/2	1.564
M-2	11-11-66	12-19-66	580	26.8	10.8	10.2	10.6	41.4	36.6	39.4	35.0	32.0	33.8	Min.	1.562
M-3	11-17-66	12-19-66	581	27.0	10.9	10.3	10.5	42.0	36.0	38.5	34.6	33.2	33.8	1/2	1.563
M-4	11-25-66	12-19-66	582	27.4	10.7	10.1	10.4	42.0	36.0	38.6	37.8	33.8	35.7	1/2	1.565
M-5	12- 1-66	12-19-66	583	27.5	11.0	9.7	10.4	40.8	37.2	38.9	36.8	33.6	35.6	1/2	1.566
M-6	12- 6-66	1-16-67	584	27.4	10.9	10.3	10.6	39.0	35.4	37.4	34.6	33.2	34.2	1/2	1.564
M-7	12-13-66	1-13-67	585	27.7	11.0	10.4	10.7	41.4	37.8	39.2	35.8	33.0	34.6	1/2	1.563
M-8	12-21-66	1-13-67	586	27.7	11.0	9.9	10.5	39.6	32.4	36.4	34.8	31.6	33.2	1/2	1.563
M-9	12-28-66	1-13-67	587	27.8	11.2	10.8	11.0	39.6	35.4	38.3	36.4	35.2	35.9	1/2	1.560
Current machine average				27.5			10.7			38.3			34.7		1.563
Cumulative machine average				27.4			10.7			36.8			34.3		
Machine factor, %				100.3			100.0			104.0			101.1		
Machine index, %				101.8			103.1			109.0			108.0		

TABLE XV

SUMMARY OF TEST RESULTS FOR MACHINE N
December, 1966 and January, 1967

(Type of medium: semichemical)

N-1	11-27-66	12- 6-66	244	26.9	11.0	9.5	10.3	31.2	27.6	29.2	27.6	24.6	26.2	1-1/2	1.569
N-2	12- 3-66	12- 8-66	245	26.1	10.3	9.1	9.8	34.2	30.6	32.6	30.4	28.4	29.5	1-1/2	1.572
N-3	12-10-66	12-16-66	246	26.7	11.0	10.0	10.7	34.8	32.4	33.6	30.6	27.6	29.2	1-1/2	1.574
N-4	12-18-66	12-22-66	247	26.4	11.0	9.6	10.2	34.2	31.2	32.6	30.2	28.2	29.4	1-1/2	1.572
N-5	12-24-66	1- 3-67	248	27.1	10.3	9.2	9.9	37.8	32.4	35.8	32.2	29.8	30.9	1-1/2	1.573
N-6	1- 2-67	1- 6-67	249	26.6	11.0	9.2	9.9	33.0	30.0	31.6	30.8	28.0	29.2	1-1/2	1.572
N-7	1- 7-67	1-13-67	250	26.4	11.5	10.0	10.8	33.0	28.2	30.7	30.2	27.0	28.6	1-1/2	1.571
N-8	1-19-67	1-25-67	251	26.7	11.8	9.4	10.4	34.8	28.2	31.2	29.4	27.2	28.1	1-1/2	1.572
Current machine average				26.6			10.3			32.2			28.9		1.572
Cumulative machine average				26.4			10.0			32.0			29.3		
Machine factor, %				100.9			103.0			100.6			98.6		
Machine index, %				98.5			98.9			91.4			89.8		

^aMaximum tension at 600 f.p.m.
^b600 f.p.m., minimum tension.

TABLE XVI
SUMMARY OF TEST RESULTS FOR MACHINE O
December, 1966 and January, 1967

(Type of medium: bogus)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ²	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, lb./in. ^a draw factor ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
O-1	11- 9-66	12-13-66	348	28.3	10.6	9.8	10.1	44.4	38.4	40.7	37.8	34.8	35.6	1-1/2	1.575
O-2	11-21-66	12-13-66	349	28.7	10.8	9.9	10.3	38.4	36.6	37.4	37.2	33.8	35.4	1-1/2	1.574
O-3	11-23-66	12-13-66	350	27.9	10.5	9.6	10.1	38.4	31.2	35.2	32.0	30.2	31.1	1-1/2	1.575
O-4	12- 2-66	12-13-66	351	29.1	10.7	10.1	10.4	44.4	39.6	41.5	38.8	35.4	36.4	1-1/2	1.573
O-5	12- 8-66	1-16-67	352	27.8	10.7	10.1	10.4	33.0	30.0	31.4	28.6	25.0	26.4	1-1/2	1.576
O-6	12-16-66	1-16-67	353	28.0	10.5	9.5	10.0	34.8	31.2	32.6	28.0	25.6	26.6	1-1/2	1.569
O-7	12-19-66	1-16-67	354	27.7	10.6	9.9	10.3	34.8	28.2	31.9	26.8	25.2	26.0	1-1/2	1.571
O-8	1- 3-67	1-16-67	355	27.5	10.1	9.2	9.7	36.0	33.0	34.8	31.0	29.2	29.9	1-1/2	1.577
Current machine average				28.1			10.1			35.7			30.9		1.574
Cumulative machine average				28.1			10.3			34.2			30.3		
Machine factor, %				100.0			98.6			104.3			102.2		
Machine index, %				104.1			97.8			101.5			96.2		

TABLE XVII

SUMMARY OF TEST RESULTS FOR MACHINE P
December, 1966 and January, 1967

(Type of medium: semichemical)

P-1	11- 1-66	12-13-66	44	28.0	11.1	10.4	10.9	38.4	34.2	36.4	35.6	32.8	34.4	Note ^c	1.542
P-2	11- 2-66	12-13-66	74	26.3	10.6	10.0	10.2	39.0	35.4	37.6	33.4	31.2	31.9	Note ^d	1.545
P-3	11-18-66	12-13-66	610	27.4	12.0	10.8	11.2	39.0	34.8	37.2	36.6 _f	33.0	35.0	Note ^e	1.538
P-4	11-22-66	12-13-66	730	26.3	10.5	10.0	10.3	39.6	34.8	37.3	Note _f			Note _f	1.500
P-5	12- 7-66	1- 3-67	313	26.1	10.2	9.7	10.0	37.8	33.6	35.6	31.0	28.2	30.0	Min.	1.533
P-6	12-14-66	1- 3-67	551	25.9	10.9	10.1	10.4	39.0	33.6	36.1	34.4 _f	31.4	32.6	Note _f	1.550
P-7	12-20-66	1-11-67	713	26.6	11.0	10.1	10.6	36.6	31.8	34.4	Note _f			Note _f	1.525
P-8	12-21-66	1-11-67	749	27.5	11.3	10.8	11.0	37.8	34.8	36.5	Note _f			Note _f	1.509
P-9	12-29-66	1-19-67	846	27.4	11.7	11.0	11.4	36.0	33.0	34.9	33.2	31.6	32.6	Note ^h	1.551
P-10	1- 9-67	1-19-67	257	25.3	11.0	10.0	10.3	36.0	32.4	34.4	32.8	30.6	31.9	Note ⁱ	1.555
Current machine average				26.7			10.6			36.0			32.6		1.535
Cumulative machine average				26.5			10.5			37.4			34.2		
Machine factor, %				100.5			101.2			96.3			95.4		
Machine index, %				98.7			102.5			102.5			101.5		

^aMaximum tension at 600 f.p.m.

^b600 f.p.m., minimum tension.

^cMaximum speed at which this roll could be corrugated with minimum tension was 475 f.p.m.

^dMaximum speed at which this roll could be corrugated with minimum tension was 275 f.p.m.

^eMaximum speed at which this roll could be corrugated with minimum tension was 125 f.p.m.

^fMaximum speed at which this roll could be corrugated with minimum tension was <100 f.p.m.

^gMaximum speed at which this roll could be corrugated with minimum tension was 425 f.p.m.

^hMaximum speed at which this roll could be corrugated with minimum tension was 575 f.p.m.

ⁱMaximum speed at which this roll could be corrugated with minimum tension was 525 f.p.m.

TABLE XVIII

SUMMARY OF TEST RESULTS FOR MACHINE Q
December, 1966 and January, 1967

(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ²	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, draw ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	lb./in. ^a	factor ^b
Q-1	11-30-66	12- 9-66	7	26.3	13.0	12.0	12.5	31.2	26.4	29.3	29.4	28.8	29.1	1-1/2	1.565
Q-2	11-30-66	12- 9-66	8	27.0	13.5	12.1	12.6	35.4	26.4	29.2	29.0	24.2	27.4	1-1/2	1.566
Q-3	12-16-66	12-29-66	9	26.1	13.4	11.7	12.4	36.0	27.6	31.8	31.2	26.4	29.6	1	1.558
Q-4	12-16-66	12-29-66	10	26.0	13.0	12.0	12.5	36.0	30.0	33.1	30.8	28.0	29.3	1	1.558
Q-5	1- 9-67	1-12-67	11	26.6	11.8	11.1	11.4	37.2	32.4	35.4	32.8	31.4	32.0	1-1/2	1.567
Q-6	1- 9-67	1-12-67	12	26.4	11.6	11.0	11.3	38.4	33.0	35.5	32.8	28.8	31.4	1-1/2	1.565
Current machine average				26.4			12.1			32.4			29.8		1.563
Cumulative machine average				26.0			11.8			31.9			29.6		
Machine factor, %				101.5			102.4			101.4			100.7		
Machine index, %				97.7			116.9			92.1			92.6		

TABLE XIX

SUMMARY OF TEST RESULTS FOR MACHINE R
December, 1966 and January, 1967

(Type of medium: semichemical)

R-1	11- 3-66	11-29-66	37	27.1	9.9	9.2	9.6	34.2	30.6	33.0	32.8	30.8	32.0	Note ^c	1.544
R-2	11- 8-66	11-29-66	38	26.5	10.5	9.8	10.2	34.8	33.0	34.1	34.0	32.0	33.2	1/2	1.556
R-3	11-20-66	12-15-66	39	28.2	10.7	9.8	10.2	37.2	31.8	34.6	36.4	32.6	34.1	1-1/2	1.570
R-4	11-30-66	12-15-66	40	27.3	11.2	9.8	10.4	34.2	30.6	32.4	30.8	29.0	29.7	1-1/2	1.571
R-5	12-22-66	1-23-67	41	27.8	11.4	10.4	11.0	35.4	32.4	34.0	31.4	28.2	29.9	1/2	1.566
R-6	12-27-66	1-23-67	42	28.7	11.7	11.0	11.3	34.8	30.6	32.8	29.8	27.4	29.0	1	1.567
Current machine average				27.6			10.5			33.5			31.3		1.562
Cumulative machine average				27.4			10.5			33.9			33.1		
Machine factor, %				100.8			100.0			93.2			94.5		
Machine index, %				102.2			100.8			95.1			97.3		

^aMaximum tension at 600 f.p.m.

^b600 f.p.m., minimum tension.

^cMaximum speed at which this roll could be corrugated with minimum tension was 475 f.p.m.

TABLE XX

SUMMARY OF TEST RESULTS FOR MACHINE S
December, 1966 and January, 1967

(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ^a	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, lb./in. ^a draw ^b factor ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
S-1	11-15-66	12-14-66	52	27.6	11.7	10.5	11.2	39.0	33.6	35.9	34.6	30.4	32.3	1/2	1.565
S-2	11-22-66	12-14-66	54	27.4	11.3	10.8	11.0	38.4	34.8	35.8	32.8	29.6	30.9	1	1.563
S-3	11-28-66	12-14-66	55	26.7	11.2	10.7	11.0	36.0	34.8	35.2	31.4	28.4	30.3	1	1.563
S-4	---	12-14-66	56	27.1	11.6	10.5	11.0	38.4	34.8	36.8	31.8	30.8	31.4	1-1/2	1.572
S-5	11-29-66	12-14-66	57	26.9	11.1	10.5	10.8	39.0	33.6	36.4	33.4	26.6	30.6	1/2	1.563
S-6	12-11-66	1-16-67	59	27.1	10.9	10.2	10.5	37.8	31.2	33.6	34.0	29.2	32.0	1/2	1.558
S-7	12-27-66	1-16-67	60	27.3	11.2	10.5	10.8	34.8	33.0	33.7	30.8	28.8	30.0	1/2	1.562
S-8	1- 1-67	1-16-67	61	26.8	11.1	10.6	10.9	34.8	29.4	32.8	29.2	25.8	27.5	1/2	1.569
Current machine average				27.1			10.9			35.0			30.6		1.564
Cumulative machine average				26.7			10.5			34.7			31.6		
Machine factor, %				101.6			104.1			100.8			96.9		
Machine index, %				100.4			105.1			99.5			95.2		

TABLE XXI

SUMMARY OF TEST RESULTS FOR MACHINE T
December, 1966 and January, 1967

(Type of medium: semichemical)

T-1	11-31-66	12- 2-66	95379	26.5	10.9	9.8	10.4	31.8	30.6	31.2	27.8	25.8	26.8	1-1/2	1.571
T-2	11-31-66	12- 2-66	95385	26.1	10.9	10.1	10.6	31.8	28.8	30.0	28.2	26.6	27.6	1-1/2	1.571
T-3	12-29-66	1- 3-67	95983	28.1	11.4	10.0	10.8	37.2	32.4	34.2	31.0	29.6	30.4	1-1/2	1.570
T-4	12-29-66	1- 3-67	95984	28.5	11.5	10.8	11.1	36.6	31.8	34.6	31.0	30.4	30.8	1-1/2	1.575
Current machine average				27.3			10.7			32.5			28.9		1.572
Cumulative machine average				26.8			10.9			33.1			29.7		
Machine factor, %				101.7			98.5			98.2			97.3		
Machine index, %				101.0			103.3			92.4			89.7		

^aMaximum tension at 600 f.p.m.^b600 f.p.m., minimum tension.

TABLE XXII

SUMMARY OF TEST RESULTS FOR MACHINE U
December, 1966 and January, 1967

(Type of medium: bogus)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ²	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, lb./in. ^a draw ^b factor ^c	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
U-1	11-21-66	12-13-66	448	29.1	11.3	10.6	11.0	32.4	28.8	30.5	31.4	27.8	29.1	Note ^c	1.548
U-2	11-23-66	12-13-66	449	27.2	11.0	9.5	10.2	33.0	30.0	31.7	30.2	27.4	29.4	Min.	1.545
U-3	11-28-66	12-13-66	450	25.9	10.8	9.8	10.3	34.8	32.4	33.8	30.6	28.2	29.8	1-1/2	1.562
U-4	11-29-66	12-13-66	451	27.1	11.7	10.3	11.0	32.4	28.8	31.0	28.4	23.2	25.6	1-1/2	1.562
U-5	12- 8-66	1-16-67	452	26.7	10.6	9.4	10.0	39.6	35.4	37.7	35.6	33.8	34.6	1-1/2	1.558
U-6	12-16-66	1-16-67	453	28.5	10.4	9.6	10.0	38.4	31.8	36.4	35.8	32.0	34.2	1-1/2	1.555
U-7	12-19-66	1-16-67	454	27.0	10.6	9.7	10.3	34.8	29.4	31.7	32.4	29.8	30.9	1-1/2	1.551
U-8	12-29-66	1-16-67	455	28.5	11.8	10.9	11.2	30.0	27.6	28.8	25.0	22.4	23.6	1	1.560
Current machine average				27.5			10.5			32.7			29.7		1.555
Cumulative machine average				27.2			10.1			35.1			32.6		
Machine factor, %				101.1			104.1			93.2			91.0		
Machine index, %				101.7			101.1			92.9			92.2		

TABLE XXIII

SUMMARY OF TEST RESULTS FOR MACHINE V
December, 1966 and January, 1967

(Type of medium: semichemical)

V-1	11-21-66	11-30-66	712	26.3	10.5	9.2	9.8	40.2	33.0	36.4	32.2	30.0	31.0	1-1/2	1.572
V-2	11-28-66	12-13-66	713	26.4	10.9	9.1	9.8	37.2	34.8	35.9	31.0	28.2	29.9	1-1/2	1.575
V-3	12- 2-66	12-15-66	714	26.4	9.8	9.0	9.5	37.2	34.8	36.4	30.6	29.2	29.7	1-1/2	1.571
V-4	12-11-66	12-23-66	715	27.4	10.5	9.3	9.8	39.6	34.2	36.8	32.4	29.4	31.0	1-1/2	1.569
V-5	12-17-66	1- 3-67	716	26.7	10.8	9.0	9.7	37.2	32.4	34.7	33.2	30.4	31.8	1	1.566
V-6	12-30-66	1-12-67	717	27.1	11.0	9.7	10.4	38.4	33.0	35.5	33.6	30.6	31.7	1-1/2	1.572
V-7	1- 9-67	1-17-67	718	27.6	10.3	9.8	10.0	35.4	30.6	33.4	30.2	28.4	29.3	1-1/2	1.572
V-8	1-14-67	1-24-67	719	27.1	11.3	9.2	10.2	37.2	31.2	34.9	30.8	29.4	30.2	1-1/2	1.573
Current machine average				26.9			9.9			35.5			30.6		1.571
Cumulative machine average				27.0			9.3			36.3			32.4		
Machine factor, %				99.4			106.5			97.9			94.5		
Machine index, %				99.5			95.6			100.9			95.1		

^aMaximum tension at 600 f.p.m.

^b600 f.p.m., minimum tension.

^cMaximum speed at which this roll could be corrugated with minimum tension was 500 f.p.m.

TABLE XXIV

SUMMARY OF TEST RESULTS FOR MACHINE W
December, 1966 and January, 1967

(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ²	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, lb./in. ^a draw ^b factor ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
W-1	12-21-66	12-27-66	A	27.2	11.0	10.4	10.7	37.8	35.4	36.6	33.6	32.4	33.1	1-1/2	1.568
W-2	12-21-66	12-27-66	B	27.0	11.0	10.3	10.7	39.0	34.8	36.4	33.6	31.2	32.8	1-1/2	1.563
W-3	12-27-66	1- 6-67	--	26.3	10.9	10.3	10.7	37.2	31.8	35.2	35.0	32.6	33.4	1	1.563
W-4	12-28-66	1- 6-67	--	26.8	11.0	10.2	10.8	40.2	31.8	36.0	33.6	31.8	32.6	1	1.563
W-5	1-12-67	1-23-67	--	26.3	10.3	10.1	10.2	36.0	33.0	34.6	31.4	28.4	29.8	1-1/2	1.571
W-6	1-13-67	1-23-67	--	26.4	10.6	9.8	10.2	37.2	32.4	34.4	32.6	30.2	31.7	1-1/2	1.567
W-7	1-15-67	1-23-67	--	26.3	10.5	10.0	10.2	35.4	32.4	34.1	32.2	30.8	31.5	1-1/2	1.571
Current machine average				26.6			10.5			35.3			32.1		1.567
Cumulative machine average				26.3			10.3			36.8			33.9		
Machine factor, %				101.3			101.5			96.1			94.8		
Machine index, %				98.5			101.2			100.4			99.9		

TABLE XV

SUMMARY OF TEST RESULTS FOR MACHINE X
December, 1966 and January, 1967

(Type of medium: semichemical)

X-1	11-30-66	12-12-66	781	27.4	11.1	10.5	10.7	41.4	36.6	40.0	39.8	35.2	37.3	1/2	1.553
X-2	12-30-66	1- 9-67	782	27.9	11.2	10.5	10.9	42.0	37.2	39.7	37.4	35.4	36.7	Min.	1.557
X-3	1- 2-67	1-17-67	783	27.0	10.7	10.0	10.2	40.2	37.2	38.6	36.8	34.4	35.6	Min.	1.549
X-4	1- 4-67	1-17-67	784	27.1	10.7	10.0	10.3	42.0	38.4	40.4	37.2	35.0	36.0	Min.	1.560
Current machine average				27.4			10.5			39.7			36.4		1.555
Cumulative machine average				26.9			10.4			40.4			37.2		
Machine factor, %				101.7			101.5			98.4			98.0		
Machine index, %				101.2			101.4			112.8			113.3		

^aMaximum tension at 600 f.p.m.^b600 f.p.m., minimum tension.

TABLE XXVI
SUMMARY OF TEST RESULTS FOR MACHINE Y
December, 1966 and January, 1967
(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ²	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, lb./in. ^a draw factor ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
Y-1	10-19-66	11-28-66	1909	26.3	10.4	10.0	10.2	34.8	28.8	32.2	31.8	30.0	30.7	1	1.561
Y-2	10-24-66	11-28-66	2525	26.8	10.4	10.0	10.2	38.4	33.0	34.9	33.8	31.2	32.3	1	1.564
Y-3	10-27-66	11-28-66	3033	26.6	10.5	10.0	10.2	36.0	32.4	34.4	32.8	30.6	31.9	1	1.562
Y-4	10-30-66	11-28-66	3462	27.5	10.9	10.5	10.7	38.4	32.4	35.8	32.6	31.4	32.0	1	1.564
Y-5	11- 1-66	11-28-66	4	26.5	10.4	10.1	10.2	35.4	32.4	34.1	34.2	32.2	33.0	1	1.568
Y-6	11- 2-66	11-28-66	118	26.7	10.5	10.1	10.2	37.8	31.2	33.4	32.6	30.8	31.8	1	1.567
Y-7	11- 4-66	11-28-66	421	26.3	10.4	10.0	10.1	39.0	31.8	35.0	34.4	31.8	32.9	1 1/2	1.567
Y-8	11-14-66	11-28-66	1489	26.8	10.7	10.0	10.3	36.6	33.0	34.7	33.0	30.4	32.2	1	1.560
Y-9	12- 1-66	1-23-67	147	26.5	10.3	9.9	10.1	32.4	30.6	31.6	30.8	28.2	29.7	1-1/2	1.567
Y-10	12- 7-66	1-23-67	736	26.5	10.2	9.8	10.0	36.0	31.8	33.7	31.0	29.4	30.2	1-1/2	1.569
Y-11	12-12-66	1-23-67	1287	26.4	10.3	9.9	10.0	33.6	28.8	31.7	29.6	28.0	28.9	1-1/2	1.566
Y-12	12-22-66	1-23-67	2508	26.6	10.3	9.8	10.0	33.6	30.6	31.6	31.4	29.0	30.3	1-1/2	1.569
Y-13	12-28-66	1-25-67	3079	26.1	10.3	9.8	10.0	33.6	30.6	32.2	30.6	29.0	29.9	1-1/2	1.564
Y-14	1- 5-67	1-25-67	639	26.0	10.0	9.7	9.9	34.2	30.6	32.2	31.4	29.0	30.3	1-1/2	1.563
Current machine average				26.5			10.1			33.4			31.1		1.565
Cumulative machine average				26.3			9.9			34.7			32.5		
Machine factor, %				100.8			102.3			96.3			95.9		
Machine index, %				98.3			97.9			94.9			96.8		

TABLE XXVII
SUMMARY OF TEST RESULTS FOR MACHINE Z
December, 1966 and January, 1967
(Type of medium: semichemical)

Z-1	11-21-66	12-14-66	174	27.3	10.7	9.8	10.4	37.8	33.0	35.4	34.8	33.0	33.9	1	1.562
Z-2	11-21-66	12-14-66	175	27.6	10.5	9.4	10.2	39.0	35.4	37.0	35.0	34.6	34.8	1	1.563
Z-3	12- 4-66	12-22-66	176	27.4	10.7	9.8	10.2	36.0	33.6	34.6	33.4	30.0	31.6	1 1/2	1.567
Z-4	12-12-66	12-22-66	177	26.5	10.4	9.3	9.8	36.6	32.4	34.6	31.8	29.0	30.6	1	1.567
Current machine average				27.2			10.2			35.4			32.7		1.565
Cumulative machine average				26.9			10.3			35.0			33.2		
Machine factor, %				101.3			99.0			101.1			98.5		
Machine index, %				100.7			98.2			100.6			101.8		

^aMaximum tension at 600 f.p.m.
^b600 f.p.m., minimum tension.

TABLE XXVIII

SUMMARY OF TEST RESULTS FOR MACHINE AA
December, 1966 and January, 1967

(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ²	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability,	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	lb./in. ^a	draw ^b factor
AA-1	12-29-66	1- 3-67	26734	26.0	10.0	9.2	9.8	36.0	31.8	34.0	29.6	27.0	28.2	1-1/2	1.575
AA-2	12-29-66	1- 3-67	26735	26.0	10.2	9.0	9.8	37.2	30.0	34.6	29.8	28.2	28.9	1-1/2	1.575
Current machine average				26.0			9.8			34.3			28.5		1.575
Cumulative machine average				26.6			10.2			32.9			30.0		
Machine factor, %				97.8			95.8			104.1			95.2		
Machine index, %				96.3			94.6			97.4			88.7		

TABLE XXIX

SUMMARY OF TEST RESULTS FOR MACHINE BB
December, 1966 and January, 1967

(Type of medium: semichemical)

BB-1	11-21-66	12-14-66	53	28.7	11.0	10.1	10.8	39.6	34.2	37.1	38.2	35.0	37.0	1/2	1.554
Current machine average				28.7			10.8			37.1			37.0		1.554
Cumulative machine average				26.4			10.0			33.4			30.2		
Machine factor, %				108.7			108.2			111.2			122.4		
Machine index, %				106.2			103.9			105.4			115.0		

^aMaximum tension at 600 f.p.m.

^b600 f.p.m., minimum tension.

TABLE XXX

SUMMARY OF TEST RESULTS FOR MACHINE CC
 December, 1966 and January, 1967

(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M ft. ²	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, draw ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	lb./in ^a	factor ^b
CC-1	11-12-66	11-28-66	86	27.6	10.4	10.0	10.2	36.0	30.0	33.2	32.6	31.0	31.8	1-1/2	1.566
CC-2	11-19-66	11-30-66	87	25.9	10.0	9.1	9.7	38.4	30.0	33.5	31.2	27.4	29.8	1-1/2	1.567
CC-3	11-30-66	12- 9-66	89	26.7	10.8	9.9	10.3	34.2	30.0	32.4	30.8	29.0	30.0	1	1.568
CC-4	12- 7-66	12-20-66	90	26.0	10.1	9.8	10.0	34.8	29.4	32.5	29.4	26.4	27.8	Min.	1.564
CC-5	12-15-66	12-28-66	91	27.0	10.4	9.6	10.1	34.2	31.8	33.1	31.2	29.0	30.0	1-1/2	1.568
CC-6	12-22-66	1- 5-67	92	25.6	11.2	9.8	10.1	36.0	27.0	31.9	30.6	27.8	29.3	1/2	1.563
CC-7	12-29-66	1-11-67	93	26.1	10.2	9.9	10.1	37.8	28.8	32.2	32.8	29.8	31.2	Min.	1.561
CC-8	1- 5-67	1-16-67	94	27.9	10.9	10.1	10.5	38.4	30.6	33.1	30.6	28.8	30.0	Min.	1.563
CC-9	1-11-67	1-19-67	95	27.2	10.5	9.6	10.1	37.8	30.0	32.9	32.4	29.0	30.5	1	1.572
Current machine average				26.7			10.1			32.8			30.0		1.566
Cumulative machine average				26.8			10.1			34.2			31.1		
Machine factor, %				99.5			100.0			95.9			96.6		
Machine index, %				98.7			97.7			93.1			93.4		

TABLE XXXI

SUMMARY OF TEST RESULTS FOR MACHINE DD
 December, 1966 and January, 1967

(Type of medium: kraft)

DD-1	12-30-66	1-12-67	17	27.9	9.8	8.6	9.2	34.2	31.2	32.2	33.0	29.0	30.5	Note ^c	1.547
DD-2	12-30-66	1-12-67	18	27.5	9.5	8.3	8.8	33.0	31.2	32.2	34.6	31.6	32.6	Note ^d	1.546
Current machine average				27.7			9.0			32.2			31.5		1.546
Cumulative machine average				28.4			8.8			33.0			31.5		
Machine factor, %				97.7			102.6			97.5			100.0		
Machine index, %				102.6			86.8			91.4			98.1		

^aMaximum tension at 600 f.p.m.

^b600 f.p.m., minimum tension.

^cMaximum speed at which this roll could be corrugated with minimum tension was 175 f.p.m.

^dMaximum speed at which this roll could be corrugated with minimum tension was 400 f.p.m.

TABLE XXXII

SUMMARY OF TEST RESULTS FOR MACHINE EE
December, 1966 and January, 1967

(Type of medium: semichemical)

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M-ft. ^a	Caliper, pt.			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, lb./in. ^a draw ^b factor ^b	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
EE-1	12- 2-66	1-23-67	383	27.7	12.0	10.8	11.4	34.8	30.6	32.3	28.4	25.4	26.7	1/2	1.571
EE-2	12- 6-66	1-23-67	1114	27.4	11.8	10.9	11.4	34.2	31.2	32.4	30.8	28.4	29.3	1	1.567
EE-3	12-15-66	1-23-67	1692	26.6	11.6	10.8	11.1	33.0	29.4	31.7	27.4	25.6	26.3	1	1.569
EE-4	12-16-66	1-25-67	3405	26.5	11.3	10.7	11.0	36.0	30.6	33.0	28.8	26.4	27.3	1/2	1.564
EE-5	12-21-66	1-25-67	4277	26.4	11.2	10.6	10.8	33.0	31.8	32.5	29.2	27.0	27.8	1/2	1.564
EE-6	12-27-66	1-25-67	5206	27.0	11.3	10.7	11.0	36.0	34.2	34.9	30.8	27.6	29.2	1/2	1.565
Current machine average				26.9			11.1			32.8			27.8		1.567
Cumulative machine average				26.7			10.8			34.1			31.2		
Machine factor, %				100.7			102.6			96.3			89.0		
Machine index, %				99.7			107.2			93.3			86.3		

TABLE XXXIII

SUMMARY OF TEST RESULTS FOR MACHINE FF
December, 1966 and January, 1967

(Type of medium: semichemical)

FF-1	1- 6-67	1-20-67	24	28.3	10.3	9.8	10.0	40.8	34.2	37.4	33.6	31.2	32.4	Min.	1.563
Current machine average				28.3			10.0			37.4			32.4		1.563
Cumulative machine average				28.9			10.3			28.8			25.1		
Machine factor, %				97.8			97.6			130.0			129.3		
Machine index, %				104.6			96.7			106.4			100.9		

^aMaximum tension at 600 f.p.m.

^b600 f.p.m., minimum tension.

DISCUSSION OF RESULTS

Shown below from Table I are the maximum and minimum current machine averages noted for each test property during the current period (December, 1966 and January, 1967). Also shown below for each test property is the current F.K.I. average which represents the mean of the current machine averages for the current period and, hence, is indicative of the test level being maintained by the industry as a whole to the extent that the industry is represented by the participating machines. Also given below for each test property is the cumulative F.K.I. average which represents the mean of the current F.K.I. averages for the previous twelve months.

	<u>Current Machine Averages</u>		<u>F.K.I. Averages</u>	
	Maximum	Minimum	Current	Cumulative
Basis wt., lb.	28.1	26.1	27.0	27.0
Caliper, pt.	12.1	9.7	10.5	10.4
Concora flat crush, p.s.i.	40.6	28.9	34.7	35.2
Single-face flat crush, p.s.i.	36.8	27.0	31.3	32.2

The runnability data for the 212 rolls evaluated during the current period are summarized as follows:

Runnability	Number of Rolls	Percentage of Total Rolls	Cumulative Percentage
Less than 600 f.p.m. with minimum tension	21	9.9	100.0
600 f.p.m. - minimum tension	31	14.6	90.1
600 f.p.m. - 1/2 lb. per in. tension	37	17.5	75.5
600 f.p.m. - 1 lb. per in. tension	30	14.2	58.0
600 f.p.m. - 1-1/2 lb. per in. tension	93	43.9	43.9

Supplementary to the runnability data described, draw factors were determined for each roll of medium at 600 f.p.m. with minimum tension (or, for rolls with poor runnability, at the maximum speed runnable with minimum tension) and are given in Tables II through XXXIII for Machines A to Z and Machines AA, BB, CC, DD, EE, and FF, respectively.

In Table XXXIV a comparison of Institute and mill Concora flat crush test results obtained on conditioned specimens is given for each machine for the current period. The inclusion of these comparisons is made possible by the fact that interested participants submit their Concora flat crush test results to The Institute of Paper Chemistry (on data sheets obtainable from the Institute). This affords each participant the opportunity to review the level of agreement noted for his data with the levels noted for the other participants. Comparisons of this kind are a helpful adjunct to other calibration procedures. Shown in Table XXXIV are (1) the Institute and mill Concora averages for each roll included in these comparisons, (2) the difference between the roll average based on Institute data and that based on mill data, (3) the Institute and mill averages based on all rolls included in the comparison, and (4) the difference between these overall averages.

The Concora flat crush data shown in Table XXXIV are summarized in Part I of Table XXXV where for each machine the following information is given: (1) Current machine average based on Institute data, (2) current machine average based on mill data, (3) the average difference - that is, the difference between the current machine average based on Institute data and that based on mill data, and (4) the maximum difference encountered in comparing Institute and mill test averages for individual rolls. In Part II of Table XXXV the average differences

TABLE XXXIV

INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR DECEMBER, 1966 AND JANUARY, 1967

Machine A						Machine B						Machine C					
Concora Flat Crush, p.s.i.						Concora Flat Crush, p.s.i.						Concora Flat Crush, p.s.i.					
Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a	Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a	Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a
A-1	433	11-22-66	39.5	36.0	-3.5	B-1	100	12- 5-66	26.3	31.5	+5.2	C-1	639	10-30-66	41.4	38.3	-3.1
A-2	434	11-22-66	38.0	33.6	-4.4	B-2	101	12- 7-66	27.5	30.8	+3.3	C-2	640	11-11-66	38.9	37.9	-1.0
A-3	441	12- 5-66	38.2	36.9	-1.3	B-3	102	12- 9-66	31.1	34.9	+3.8	C-3	641	11-28-66	41.9	38.4	-3.5
A-4	442	12- 5-66	35.5	35.0	-0.5	B-4	103	12-13-66	30.6	35.7	+5.1	C-4	642	12- 6-66	41.4	37.4	-4.0
A-5	449	12-11-66	36.8	34.9	-1.9							C-5	643	12-19-66	40.3	40.3	0.0
A-6	450	12-11-66	35.6	33.3	-2.3							C-6	644	12-29-66	39.8	38.6	-1.2
A-7	457	12-29-66	33.6	33.7	+0.1												
A-8	458	12-29-66	34.2	32.2	-2.0												
A-9	465	1- 3-67	36.5	35.0	-1.5												
A-10	466	1- 3-67	37.6	32.5	-5.1												
Current machine av.			36.6	34.3	-2.3	Current machine av.			28.9	33.2	+4.3	Current machine av.			40.6	38.5	-2.1
Machine D						Machine E						Machine F					
D-1	129	11- 3-66	31.4	34.8	+3.4	E-1	76	11-12-66	32.8	35.3	+2.5	F-1	22	11-13-66	43.4	41.8	-1.6
D-2	130	11- 7-66	32.5	34.4	+1.9	E-2	77	11-18-66	33.0	31.6	-1.4	F-2	23	11-28-66	40.9	38.7	-2.2
D-3	131	11-15-66	33.5	35.4	+1.9	E-3	78	11-30-66	29.9	31.4	+1.5						
D-4	132	11-23-66	34.0	35.9	+1.9	E-4	79	12- 7-66	33.6	35.0	+1.4						
D-5	133	12- 2-66	32.6	34.9	+2.3	E-5	80	12-15-66	32.8	30.7	-2.1						
D-6	134	12- 9-66	31.6	34.0	+2.4	E-6	81	12-20-66	32.6	34.7	+2.1						
D-7	135	12-15-66	32.3	35.3	+3.0	E-7	82	12-29-66	30.1	31.1	+1.0						
D-8	136	12-29-66	32.2	33.6	+1.4	E-8	83	1- 5-67	31.4	34.6	+3.2						
						E-9	84	1-11-67	31.8	28.1	-3.7						
Current machine av.			32.5	34.8	+2.3	Current machine av.			32.0	32.5	+0.5	Current machine av.			42.2	40.2	-2.0
Machine G						Machine H						Machine J					
G-1	244	11-28-66	31.1	32.9	+1.8	H-1	A	12-28-66	39.8	36.2	-3.6	J-1	1659	11-16-66	32.4	32.6	+0.2
G-2	245	12- 4-66	35.3	37.4	+2.1	H-2	B	12-28-66	40.4	37.0	-3.4	J-2	1660	11-16-66	32.0	32.3	+0.3
G-3	246	12-11-66	32.9	37.1	+4.2	H-3	A	1-12-67	36.1	33.8	-2.3	J-3	1667	11-29-66	32.0	31.8	-0.2
G-4	247	12-17-66	35.3	36.6	+1.3	H-4	B	1-12-67	37.1	34.8	-2.3	J-4	1668	11-29-66	30.7	30.1	-0.6
G-5	248	12-24-66	32.0	36.5	+4.5	H-5	--	1-13-67	39.1	38.2	-0.9	J-5	1675	11-29-66	31.3	30.6	-0.7
G-6	249	1- 1-67	33.2	36.2	+3.0	H-6	--	1-14-67	36.7	37.3	+0.6	J-6	1676	11-29-66	31.2	31.4	+0.2
G-7	250	1- 8-67	35.8	37.3	+1.5	H-7	--	1-15-67	38.4	37.4	-1.0						
G-8	251	1-19-67	32.4	33.7	+1.3	H-8	--	1-16-67	38.6	37.1	-1.5						
Current machine av.			33.5	36.0	+2.5	Current machine av.			38.3	36.5	-1.8	Current machine av.			31.6	31.5	-0.1

^aSee end of table for footnote.

TABLE XXXIV (Continued)

INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR DECEMBER, 1966 AND JANUARY, 1967

Machine K						Machine L						Machine M					
Concora Flat Crush,						Concora Flat Crush,						Concora Flat Crush,					
p.s.i.						p.s.i.						p.s.i.					
Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a	Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a	Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a
K-1	480	11-17-66	37.8	38.2	+0.4	L-1	--	11-21-66	36.8	35.6	-1.2	M-1	578	10-29-66	38.3	39.2	+0.9
K-2	481	11-17-66	39.2	38.3	-0.9	L-2	--	11-22-66	37.8	36.1	-1.7	M-2	580	11-11-66	39.4	39.2	-0.2
K-3	482	11-22-66	41.2	38.3	-2.9	L-3	--	1-14-67	34.0	34.4	+0.4	M-3	581	11-17-66	38.5	38.8	+0.3
K-4	483	11-24-66	37.7	37.1	-0.6	L-4	--	1-15-67	34.4	34.0	-0.4	M-4	582	11-25-66	38.6	39.4	+0.8
K-5	484	11-28-66	36.5	37.0	+0.5	L-5	--	1-17-67	34.1	34.2	+0.1	M-5	583	12-1-66	38.9	38.6	-0.3
K-6	485	12-6-66	39.2	38.0	-1.2							M-6	584	12-6-66	37.4	42.1	+4.7
K-7	486	12-14-66	37.6	38.9	+1.3							M-7	585	12-13-66	39.2	40.8	+1.6
K-8	487	12-20-66	39.5	38.8	-0.7							M-8	586	12-21-66	36.4	40.7	+4.3
K-9	488	12-21-66	37.3	37.9	+0.6							M-9	587	12-28-66	38.3	41.3	+3.0
K-10	489	12-28-66	38.0	38.2	+0.2												
K-11	490	1-2-67	36.8	36.5	-0.3												
K-12	491	1-9-67	34.1	36.4	+2.3												
Current machine av.			37.9	37.8	-0.1	Current machine av.			35.4	34.9	-0.5	Current machine av.			38.3	40.0	+1.7
Machine N						Machine O						Machine P					
Concora Flat Crush,						Concora Flat Crush,						Concora Flat Crush,					
p.s.i.						p.s.i.						p.s.i.					
Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a	Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a	Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a
N-1	244	11-27-66	29.2	30.0	+0.8	O-1	348	11-9-66	40.7	41.4	+0.7	P-1	44	11-1-66	36.4	36.5	+0.1
N-2	245	12-3-66	32.6	35.8	+3.2	O-2	349	11-21-66	37.4	36.6	-0.8	P-2	74	11-2-66	37.6	35.8	-1.8
N-3	246	12-10-66	33.6	34.3	+0.7	O-3	350	11-23-66	35.2	37.8	+2.6	P-3	610	11-18-66	37.2	37.0	-0.2
N-4	247	12-18-66	32.6	33.8	+1.2	O-4	351	12-2-66	41.5	42.0	+0.5	P-4	730	11-22-66	37.3	34.9	-2.4
N-5	248	12-24-66	35.8	36.1	+0.3	O-5	352	12-8-66	31.4	30.5	-0.9	P-5	313	12-7-66	35.6	34.4	-1.2
N-6	249	1-2-67	31.6	34.4	+2.8	O-6	353	12-16-66	32.6	29.9	-2.7	P-6	551	12-14-66	36.1	35.8	-0.3
N-7	250	1-7-67	30.7	35.8	+5.1	O-7	354	12-19-66	31.9	29.5	-2.4	P-7	713	12-20-66	34.4	34.4	0.0
N-8	251	1-19-67	31.2	32.3	+1.1	O-8	355	1-3-67	34.8	38.5	+3.7	P-8	749	12-21-66	36.5	35.3	-1.2
Current machine av.			32.2	34.1	+1.9	Current machine av.			35.7	35.8	+0.1	Current machine av.			36.0	35.4	-0.6
Machine Q						Machine R						Machine S					
Concora Flat Crush,						Concora Flat Crush,						Concora Flat Crush,					
p.s.i.						p.s.i.						p.s.i.					
Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a	Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a	Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a
Q-1	7	11-30-66	29.3	32.4	+3.1	R-1	37	11-3-66	33.0	33.4	+0.4	S-1	52	11-15-66	35.9	32.3	-3.6
Q-2	8	11-30-66	29.2	34.7	+5.5	R-2	38	11-8-66	34.1	32.9	-1.2	S-2	54	11-22-66	35.8	31.9	-3.9
Q-3	9	12-16-66	31.8	36.2	+4.4	R-3	39	11-20-66	34.6	33.3	-1.3	S-3	55	11-28-66	35.2	31.8	-3.4
Q-4	10	12-16-66	33.1	32.8	-0.3	R-4	40	11-30-66	32.4	33.0	+0.6	S-5	57	11-29-66	36.4	30.7	-5.7
Q-5	11	1-9-67	35.4	41.4	+6.0	R-5	41	12-22-66	34.0	32.2	-1.8	S-6	59	12-11-66	33.6	34.9	+1.3
Q-6	12	1-9-67	35.5	40.8	+5.3	R-6	42	12-27-66	32.8	33.6	+0.8	S-7	60	12-27-66	33.7	37.0	+3.3
Current machine av.			32.4	36.4	+4.0	Current machine av.			33.5	33.1	-0.4	Current machine av.			35.1	33.1	-2.0

^aSee end of table for footnote.

TABLE XXXIV (Continued)

INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR DECEMBER, 1966 AND JANUARY, 1967

Machine T						Machine U						Machine V					
Concora Flat Crush,						Concora Flat Crush,						Concora Flat Crush,					
Code	Mill Roll No.	Date Made	Insti- tute	P.s.i.		Code	Mill Roll No.	Date Made	Insti- tute	P.s.i.		Code	Mill Roll No.	Date Made	Insti- tute	P.s.i.	
				Mill	Differ- ence ^a					Mill	Differ- ence ^a					Mill	Differ- ence ^a
T-1	95379	11-31-66	31.2	34.6	+3.4	U-1	448	11-21-66	30.5	31.2	+0.7	V-1	712	11-21-66	36.4	40.7	+4.3
T-2	95385	11-31-66	30.0	34.6	+4.6	U-2	449	11-23-66	31.7	32.4	+0.7	V-2	713	11-28-66	35.9	37.3	+1.4
T-3	95983	12-29-66	34.2	36.6	+2.4	U-3	450	11-28-66	33.8	34.8	+1.0	V-3	714	12- 2-66	36.4	38.5	+2.1
T-4	95984	12-29-66	34.6	37.1	+2.5	U-4	451	11-29-66	31.0	30.0	-1.0	V-4	715	12-11-66	36.8	37.6	+0.8
						U-5	452	12- 8-66	37.7	37.9	+0.2	V-5	716	12-17-66	34.7	36.9	+2.2
						U-6	453	12-16-66	36.4	37.1	+0.7	V-6	717	12-30-66	35.5	34.9	-0.6
						U-7	454	12-19-66	31.7	32.0	+0.3	V-7	718	1 - 9-67	33.4	36.1	+2.7
						U-8	455	12-29-66	28.8	27.7	-1.1	V-8	719	1 -14-67	34.9	35.8	+0.9
Current machine av.			32.5	35.7	+3.2	Current machine av.			32.7	32.9	+0.2	Current machine av.			35.5	37.2	+1.7
Machine W						Machine X						Machine Y					
W-1	A	12-21-66	36.6	36.4	-0.2	X-1	781	11-30-66	40.0	40.6	+0.6	Y-1	1909	10-19-66	32.2	35.7	+3.5
W-2	B	12-21-66	36.4	35.8	-0.6	X-2	782	12-30-66	39.7	41.2	+1.5	Y-2	2525	10-24-66	34.9	37.5	+2.6
W-3	--	12-27-66	35.2	34.9	-0.3	X-3	783	1 - 2-67	38.6	37.4	-1.2	Y-3	3033	10-27-66	34.4	36.7	+2.3
W-4	--	12-28-66	36.0	34.4	-1.6	X-4	784	1 - 4-67	40.4	41.0	+0.6	Y-4	3462	10-30-66	35.8	35.5	-0.3
W-5	--	1 -12-67	34.6	35.8	+1.2							Y-5	4	11- 1-66	34.1	37.0	+2.9
W-6	--	1 -13-67	34.4	34.2	-0.2							Y-6	118	11- 2-66	33.4	36.4	+3.0
W-7	--	1 -15-67	34.1	34.4	+0.3							Y-7	421	11- 4-66	35.0	38.0	+3.0
												Y-8	1489	11-14-66	34.7	35.5	+0.8
												Y-9	147	12- 1-66	31.6	33.5	+1.9
												Y-10	736	12- 7-66	33.7	34.7	+1.0
												Y-11	1287	12-12-66	31.7	34.1	+2.4
												Y-12	2508	12-22-66	31.6	33.5	+1.9
												Y-13	3079	12-28-66	32.2	35.3	+3.1
												Y-14	639	1 - 5-67	32.2	34.8	+2.6
Current machine av.			35.3	35.1	-0.2	Current machine av.			39.7	40.0	+0.3	Current machine av.			33.4	35.6	+2.2
Machine AA						Machine BB						Machine CC					
AA-1	26734	12-29-66	34.0	36.6	+2.6	BB-1	53	11-21-66	37.1	36.1	-1.0	CC-1	86	11-12-66	33.2	33.6	+0.4
AA-2	26735	12-29-66	34.6	35.9	+1.3							CC-2	87	11-19-66	33.5	33.2	-0.3
												CC-3	89	11-30-66	32.4	30.2	-2.2
												CC-4	90	12- 7-66	32.5	28.2	-4.3
												CC-5	91	12-15-66	33.1	29.3	-3.8
												CC-6	92	12-22-66	31.9	28.3	-3.6
												CC-7	93	12-29-66	32.2	35.0	+2.8
												CC-8	94	1 - 5-67	33.1	33.4	+0.3
												CC-9	95	1 -11-67	32.9	30.7	-2.2
Current machine av.			34.3	36.2	+1.9	Current machine av.			37.1	36.1	-1.0	Current machine av.			32.8	31.3	-1.5

^aSee end of table for footnote.

TABLE XXXIV (Continued)

INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR DECEMBER, 1966 AND JANUARY, 1967

Machine DD						Machine EE						Machine FF					
			Concora Flat Crush,						Concora Flat Crush,						Concora Flat Crush,		
			p.s.i.						p.s.i.						p.s.i.		
Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a	Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a	Code	Mill Roll No.	Date Made	Insti- tute	Mill	Differ- ence ^a
DD-1	17	12-30-66	32.2	32.5	+0.3	EE-1	383	12- 2-66	32.3	34.9	+2.6	FF-1	24	1 - 6-67	37.4	36.8	-0.6
DD-2	18	12-30-66	32.2	32.6	+0.4	EE-2	1114	12- 6-66	32.4	34.6	+2.2						
						EE-3	1692	12-15-66	31.7	34.3	+2.6						
						EE-4	3405	12-16-66	33.0	35.2	+2.2						
						EE-5	4277	12-21-66	32.5	35.5	+3.0						
						EE-6	5206	12-27-66	34.9	37.3	+2.4						
Current machine av.			32.2	32.6	+0.4	Current machine av.			32.8	35.3	+2.5	Current machine av.			37.4	36.8	-0.6

^aThis difference is the amount in p.s.i. units by which the mill result is higher or lower than the Institute result.

TABLE XXXV

PART I: A COMPARATIVE SUMMARY FOR EACH MACHINE OF THE CONCORA FLAT CRUSH AVERAGES BASED ON INSTITUTE DATA AND THOSE BASED ON MILL DATA
FOR THE CURRENT PERIOD (DECEMBER, 1966 AND JANUARY, 1967)

Machine code	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	
Number of rolls compared	10	4	6	8	9	2	8	8	0	6	12	5	9	8	8	10	6	6	6	6	4	8	8	7	4	14	0	2	1	9	2	6	1
Concora flat crush, p.s.i.																																	
Current machine av. (Institute) ^A	36.6	28.9	40.6	32.5	32.0	42.2	33.5	38.3	--	31.6	37.9	35.4	38.3	32.2	35.7	36.0	32.4	33.5	35.1	32.5	32.7	35.5	35.3	39.7	33.4	--	34.3	37.1	32.8	32.2	32.8	37.4	
Current machine av. (Mill) ^B	34.3	33.2	38.5	34.8	32.5	40.2	36.0	36.5	--	31.5	37.8	34.9	40.0	34.1	35.8	35.4	36.4	33.1	33.1	35.7	32.9	37.2	35.1	40.0	35.6	--	36.2	36.1	31.3	32.6	35.3	36.8	
Average difference ^C	-2.3	+4.3	-2.1	+2.3	+0.5	-2.0	+2.5	-1.8	--	-0.1	-0.1	-0.5	+1.7	+1.9	+0.1	-0.6	+4.0	-0.4	-2.0	+3.2	+0.2	+1.7	-0.2	+0.3	+2.2	--	+1.9	-1.0	-1.5	+0.4	+2.5	-0.6	
Maximum difference ^C	-5.1	+5.2	-4.0	+3.4	-3.7	-2.2	+4.5	-3.6	--	-0.7	-2.9	-1.7	+4.7	+5.1	+3.7	-2.4	+6.0	-1.8	-5.7	+4.6	-1.1	+4.3	-1.6	+1.5	+3.5	--	+2.6	-1.0	-4.3	+0.4	+3.0	-0.6	

PART II. A TABULATION FOR EACH MACHINE OF THE AVERAGE DIFFERENCE (PERCENT) BETWEEN THE CONCORA FLAT CRUSH
BASED ON INSTITUTE DATA AND THAT BASED ON MILL DATA

Average difference, % ^d																																
Current report (Dec.-Jan.)	-6.3	+14.9	-5.2	+7.1	+1.6	-4.7	+7.5	-4.7	--	-0.3	-0.3	-1.4	+4.4	+5.9	+0.3	-1.7	+12.3	-1.2	-5.7	+9.8	+0.6	+4.8	-0.6	+4.8	+6.6	--	+5.5	-2.7	-4.6	+1.2	+7.6	-1.6
122nd report (Oct.-Nov.)	+0.8	+0.3	-6.5	+6.9	-1.7	-2.1	+0.9	-7.7	--	-2.4	-1.3	-5.3	-2.7	+3.7	+1.0	-0.8	+4.2	-4.3	-13.9	-1.5	+1.9	+6.9	-2.2	-1.5	--	--	-1.4	--	-1.4	+6.9	--	--
121st report (Aug.-Sept.)	+1.8	--	-2.5	+8.8	-7.3	+0.7	+3.8	-3.8	--	-3.4	-4.2	+3.8	0.0	+2.6	+1.9	-2.5	+29.7	-2.6	+4.4	--	+2.6	+6.7	-2.1	-4.2	+7.1	--	--	--	-8.2	+2.4	+17.9	--

^aComparisons based on current machine average include only those rolls for which mill data were submitted.

^bAverage difference is the difference between the current machine average based on Institute test results and that based on mill test results with the Institute test results used as the reference. See Table XXIV.

^cMaximum difference is the greatest difference encountered in comparing Institute and mill test averages for individual rolls. See Table XXIV.

^dAverage difference (percent) is computed by dividing the average difference in p.s.i. (shown above in Part I of this table) by the Institute current machine average and multiplying the result by 100.

given in Part I are expressed as percentage differences; corresponding data from the previous two reports are included in Part II of Table XXXV so that the current level of agreement may be interpreted with this additional information at hand.

In Table XXXVI a summary of the agreement between Institute and mill Concora flat crush data is given for the current period with corresponding data from the previous bimonthly period also included. The data shown for the current period indicate that agreement between Institute and mill Concora data was good, although not as good as that for the previous period.

TABLE XXXVI

SUMMARY OF AGREEMENT BETWEEN INSTITUTE AND MILL
CONCORA FLAT CRUSH DATA

Average Percentage Difference Between Institute and Mill Concora Flat Crush Test Results ^a	Percentage of All Machines Included Within the Indicated Range	
	Previous Period ^b	Current Period ^c
<u>± 1.0</u>	18.5	20.0
<u>± 2.5</u>	55.6	40.0
<u>± 5.0</u>	70.4	60.0
<u>±10.0</u>	96.3	93.3
Max.	100.0 ^d	100.0 ^e

^aThe average obtained at the Institute was used as the reference in the calculation of the percentage differences.

^bOctober and November, 1966.

^cDecember, 1966 and January, 1967.

^dMaximum percentage difference was +13.9.

^eMaximum percentage difference was +14.9.

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